Image

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1626

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
APPEAL TO THE BOARD OF APPEALS AND INTERFERENCES

IN RE APPLICATION OF:	VOIT ET AL.	BOX:	AF
SERIAL NO.	09/851,214	CONFIRMATION NO.:	4235
FILED:	MAY 08, 2001	GROUP ART UNIT:	1626
FOR:	HYDROGENATION CATALYSTS	EXAMINER:	E. O. SACKEY
DATE:	DECEMBER 10, 2003		
TO:	HON. COMMISSIONER OF PATENTS AND TRADEMARKS		

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner of Patents and Trademarks, Alexandria, Va 22313-1450, on:

February 10, 2004
Date of Deposit

Jason D. Voight
Person Making Deposit

Jason D. Voight
Signature

February 10, 2004
Date of Signature

Sir:

1. ☒ NOTICE OF APPEAL: Applicant hereby appeals to the Board of Appeals from the decision dated *September 10, 2003,* of the Primary Examiner finally rejecting Claims *21 to 40*.
2. ☒ Applicants hereby petition for a -/- month extension of time under 37 C.F.R. §1.136. Applicants request entry of their timely reply dated *December 10, 2003,* for purposes of appeal.
   - ☐ A check to cover the fee of -/- is enclosed.
   - ☐ A petition for a -/- month extension of time including the requisite fee of -/- has been filed along with the amendment under 37 C.F.R. §1.116 dated -/-.
3. ☐ BRIEF ON APPEAL in this application is transmitted herewith.
4. ☐ An oral Hearing is requested
   - ☐ The Oral Hearing fee of -/- is enclosed.
5. ☒ Fee *$330.00*
   - ☒ Enclosed.
   - ☐ Not required (Fee paid in prior appeal).
   - ☐ Charge to Deposit Account No. 11.0345.
6. ☒ The Commissioner is hereby authorized to charge any fee which may be further required, or credit any over payment to Deposit Account No. 11.0345. A duplicate copy of this sheet is attached.

Respectfully submitted,
KEIL & WEINKAUF

Jason D. Voight
Reg. No. 42,205

1350 Connecticut Ave, N.W.
Washington, D.C. 20036
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Paper No. 17

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Honorable Commissioner
for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL UNDER 37 C.F.R. §1.192

Sir:

This is an Appeal from the Examiner's Final Rejection of Claims 21 to 40, dated September 10, 2003. Claims 22 to 40 are currently pending.

REAL PARTY IN INTEREST:

The real party in interest is BASF Aktiengesellschaft, 67056 Ludwigshafen, Germany.

RELATED APPEALS AND INTERFERENCES:

To the best of the undersigned's knowledge, there are no related appeals or interferences within the meaning of 37 C.F.R. §1.192(c)(2).

STATUS OF THE CLAIMS:

The claims on Appeal before the Board of Patent Appeals and Interferences are Claims 21 to 40. A copy of these claims is found in the attached Appendix.

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Claims 21 to 40 as currently pending were submitted with appellants' reply dated June 06, 2003 (*Paper No. 11, date of the Certificate of Mailing*). In light of the Examiner's withdrawal of Claims 41 to 48 in the Final Action (*Paper 12, date of mailing September 10, 2003*), appellants canceled those claims in their reply dated December 10, 2003 (*Paper No. 13, date of the Certificate of Mailing*). The Examiner issued an Advisory Action (*Paper No. 15, date of mailing January 08, 2004*) indicating that appellants' amendment will be entered for purposes of Appeal. The Claims therefore stand as submitted in appellants' reply dated December 10, 2003 (*Paper No. 13*). No further amendments have been filed in this application after final rejection.

SUMMARY OF THE INVENTION:

Appellants' invention is drawn to a hydrogenation catalyst wherein the catalytically effective component is a composition consisting of[1)]

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

Appellants have found that the particularities of the catalytically effective component provide for a catalyst which exhibits high selectivity and a low level of unwanted by-products coupled with the capability to remain effective over a prolonged period of time[2)].

1) Independent Claims 21 and 33.

2) Page 2, indicated lines 33 to 44, in conjunction with Example 1b), page 11, indicated lines 1 to 16, and the data compiled in Table page 12, of the application.

ISSUES PRESENTED:

I. Whether the Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was rendered unpatentable under 35 U.S.C. §103(a) by the disclosure of ***Dewdney et al.*** in ***US-A 3,986,985***[3] or in ***US 4,064,172***[4][5].

II. Whether the Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was rendered unpatentable under 35 U.S.C. §103(a) by the disclosure of ***Flick et al.*** (**US-A 5,527,946**).

III. Whether the Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was rendered unpatentable under 35 U.S.C. §103(a) by the disclosure of ***Dewdney et al.*** when taken in combination with the disclosure of ***Flick et al.***

GROUPING OF THE CLAIMS:

For the issues above, where a ground of rejection is applied to more than one claim, it is affirmed that the rejected claims stand or fall together.

ARGUMENTS:

I. The Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was prima facie obvious under 35 U.S.C. §103(a) in light of the disclosure of ***Dewdney et al.***

The teaching of ***Dewdney et al.*** relates to a particular iron oxide catalyst for the hydrogenation of adipodinitril to hexamethylenediamine. More particularly, ***Dewdney et al.*** provide that the level of impurities can be controlled when the iron oxide catalyst is substantially free from haematite[6], and that the iron to oxygen ratio in the catalyst advantageously corresponds to a spinel structure[7]. Accordingly, ***Dewdney et al.*** prepare their catalyst preferably from natural-

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6) For example, col. 2, indicated lines 21 to 35, of ***US 3,986,985***.

7) Corresponding to the structure of magnetite, chemical formula Fe_3O_4. See also the material enumerated in ftn. (2), page 3, of appellants' Paper 11 and provided by appellants.

ly occurring magnetite ore[8], optionally adding iron or iron oxide to the ore to achieve an iron oxide content of the catalyst of not less than 96.5%[9]. ***Dewdney t al.*** further state

> *It is preferable not to make any additions, other than iron oxide or iron, to the feed before or during fusion, as is done, for example, when promoters are added to iron oxides in the manufacture of ammonia synthesis catalysts.*[10]

The Examiner contends that the difference between the invention defined by appellants' claims and the catalyst disclosed by ***Dewdney et al.*** resides in the generic description of the catalyst and in the ratios[11]. However, it is well settled that the mere fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a prima facie case of obviousness[12].

The teaching of ***Dewdney et al.*** does not suggest or imply the utilization of a catalytically effective composition which *consists of* constituents (a) to (d) as defined in appellants' independent Claims 21 and 33, and wherein the following additional requirements are met:

- a promoter is present in an amount of from 0.001 to 0.3% by weight based on constituent (a), and
- the promoter is based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium, and
- manganese is present in an amount of from 0.001 to 1% by weight, based on constituent (a).

The Examiner contends that ***Dewdney et al.***'s Examples 1 and 2 provide for compositions which meet appellants' requirements[13]. ***Dewdney et al.*** refer in Example 1 to a Swedish magnetite ore and in Example 2 to a Labrador haematite ore. The Swedish magnetite ore contains a combination of Al_2O_3, SiO_2 and V_2O_5 in a total amount of about *0.9%* by

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8) For a review of the composition of iron ores in general see the material enumerated in ftn. (3), page 3, of appellants' Paper 11 and provided by appellants.

9) For example, col. 2, indicated lines 50 to 56, of ***US 3,986,985***.

10) For example, col. 2, indicated lines 56 to 61, of ***US 3,986,985***.

11) Paper No. 03, page 5, lines 6 to 12. Similarly, Paper No. 10, page 4, lines 10 to 13.

12) *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (CAFC 1994); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (CAFC 1992)

13) Paper No. 12, page 4, lines 5 and 6.

weight, based on the iron component, and the Labrador haematite contains a combination of Al_2O_3 and SiO_2 in a total amount of about 1.7% by weight, based on the iron component. The respective amounts are by far beyond the content of promoter elements which is allowed in accordance with appellants' invention as claimed. Further, neither one of the ores utilized in the representative examples of ***Dewdney et al.*** contain manganese. Appellants' catalytic composition is, therefore, clearly distinguished from the compositions used by ***Dewdney et al.*** in the representative examples.

To establish prima facie obviousness, all claim limitations must be taught or suggested by the prior art[14]. The mere fact that a prior art teaching may be modified in some manner so as to result in the invention as claimed does not render the requisite modification, and correspondingly the claimed invention, obvious where the prior art fails to suggest the desirability of such a modification[15]. The disclosure of ***Dewdney et al.*** does not teach or suggest all of the limitations which characterize the catalytically effective component defined in appellants' independent Claims 21 and 33, and the disclosure of ***Dewdney et al.*** also fails to suggest or imply the desirability of the modification which is necessary to arrive at the specific composition of appellants' catalytically effective component. Appellants' invention is therefore not deemed to be rendered obvious within the meaning of Section 103(a) by the teaching of ***Dewdney at al.***

II. The Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was rendered prima facie obvious under 35 U.S.C. §103(a) in light of the disclosure of ***Flick et al.***

The disclosure of ***Flick et al.*** relates to a catalyst for the partial hydrogenation of α,ω-dinitriles to α,ω-aminonitriles which catalyst is composed of[16]

(a) a nickel, cobalt, iron, ruthenium or rhodium compound,

(b) from 0.01 to 25% of a promoter based on a metal selected from the group of palladium, platinum, iridium, osmium, iron, copper, silver, gold, chromium, molybdenum, tungsten, manganese, rhenium,

14) *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

15) *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1783-84 (CAFC 1992); *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (CAFC 1984)

16) Col. 1, indicated line 62, to col. 2, indicated line 12, of ***US 5,527,946***.

zinc, cadmium, lead, aluminum, tin, phosphorus, arsenic, antimony, bismuth and rare earth metals, and

(c) from 0 to 5% of a compound based on an alkali metal or on an alkaline earth metal.

Flick et al. further point out in the Abstract of the disclosure that[17)]

> *the component* (a) is not based on iron *or iron and one of the metals selected from the group consisting of cobalt, ruthenium and rhodium* when (b) is *a promoter* based on *a metal selected from the group consisting of* titanium, manganese, chromium *and molybdenum,*

Additionally, ***Flick et al.*** mention that the catalyst may be supported or unsupported and that suitable support materials are porous oxides such as alumina, silica, alumosilicates, lanthanum oxide, titanium dioxide, zirconium dioxide, magnesium dioxide, zinc oxide an zeolites as well as active carbon and mixtures of those materials[18)].

The Examiner erroneously contends that ***Flick et al.*** teach the use of iron based compounds and silicon and titanium promoters pointing to the Abstract and catalyst B disclosed in col. 2, indicated lines 33 to 38, of ***US 5,527,946***[19)]. On the one hand, the Abstract of ***Flick et al.***'s disclosure clearly *excludes* iron based catalysts which contain as a promoter titanium. On the other hand, the promoter metals enumerated as component (b) of ***Flick et al.***'s catalyst do not include silicon. Last but not least, the catalyst B of ***Flick et al.*** is not based on iron but is based on cobalt and contains iron oxide (Fe_2O_3) as a promoter element in an amount of 0.5% by weight.

The disclosure of ***Flick et al.*** neither suggests nor implies a catalytically effective composition consisting of appellants' constituents (a) to (d) wherein constituent (a) is iron or a compound based on iron and (a) is combined

- with a promoter (b) composed of 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium, which is present in an amount of from 0.001 to 0.3% by weight based on the iron component (a); and
- with manganese (d) in an amount of from 0.001 to 1% by weight based on the iron component (a).

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17) Abstract of ***US 5,527,946***, lines 17 to 21, *emphasis added.*

18) Col. 2, indicated lines 46 to 51, of ***US 5,527,946***.

19) Paper No. 03, page 5, lines 13 to 15.

The Examiner further takes the position that the teaching of ***Flick et al.*** places the constituents and the amounts of appellants' catalytically effective composition within the purview of a person of ordinary skill in the art[20]. However, even if appellants' claims are used as a roadmap it is not possible to pick and choose the information from the disclosure of ***Flick et al.*** which is necessary to recreate the combination which characterizes appellants' catalytically effective composition.

On the one hand, of the promoter metals which are enumerated by ***Flick et al.*** as constituent (b) encompass aluminum as the only promoter metal corresponding to appellants' component (b). It is therefore not possible to recreate appellants' requirement for a promoter (b) composed of 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium. On the other hand, ***Flick et al.*** exclude manganese as a promoter constituent when the catalyst is based on iron. It is therefore not possible to recreate appellants' requirement for the presence of manganese in the iron based catalytically effective component of appellants' catalyst.

The disclosure of ***Flick et al.*** neither teaches nor suggests all of the limitations which characterize appellants' invention, and the disclosure of ***Flick et al.*** also fails to suggest or imply the desirability of the modification which is necessary to arrive at the specific composition of appellants' catalytically effective component. Appellants' invention is therefore not deemed to be rendered obvious within the meaning of Section 103(a) by the teaching of ***Flick at al.***

III. The Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was prima facie obvious under 35 U.S.C. §103(a) in light of the disclosure of ***Dewdney et al.*** when taken in combination with the disclosure of ***Flick et al.***

The Examiner takes the position that a person of ordinary skill in the art would have been motivated to prepare a catalyst wherein the catalytically effective component consists of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on

20) Paper No. 12, page 5, lines 4 to 6.

2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese,

as required in accordance with appellants' invention by combining the teachings of ***Dewdney et al.*** and ***Flick et al.***[21].

The Examiner's position is not deemed to be well taken because neither the teaching of ***Dewdney et al.*** nor the disclosure of ***Flick et al.*** suggest or imply the desirability of manganese in an iron-based catalyst. The disclosure of ***Dewdney et al.*** is completely silent concerning manganese as a constituent of the iron oxide catalyst and ***Flick et al.*** exclude manganese as a promoter metal (b) when the catalyst is based on iron[22]. As such, a combination of ***Dewdney et al.***'s teaching and ***Flick et al.***'s disclosure cannot suggest or imply the desirability of the specific modification which is required to arrive at appellants' invention. However, in a determination under Section 103(a) the teaching or suggestion to make the claimed combination has to be found in the prior art and cannot be based on the applicant's disclosure[23]. A combination of the teachings of ***Dewdney et al.*** and ***Flick et al.*** is therefore also not deemed to establish that appellants' invention was obvious within the meaning of 35 U.S.C. §103(a).

CONCLUSION

In light of the foregoing explanations and remarks, appellants respectfully urge that the Examiner erred finding that appellants' invention which requires a catalytically effective constituent consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

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21) Paper No. 03, page 5, line 16, to page 6, line 6.

22) The section of ***Flick et al.***'s abstract cited at the outset of page 6 of this brief.

23) *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (CAFC 1984); see also, eg., *Interconnect. Planning Corp. v. Feil*, 774 F.2d 1132, 227 USPQ 543 (CAFC 1985)

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese,

was rendered *prima facie* obvious to a person having ordinary skill in the pertinent field by the teaching of ***Dewdney et al.*** and/or ***Flick et al.*** It is therefore respectfully requested that the Examiner's rejection of appellants' Claims 21 to 40 under 35 U.S.C. §103(a) as being unpatentable in light of the disclosure of ***Dewdney et al.*** and/or ***Flick et al.*** be reversed.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,
KEIL & WEINKAUF

Jason D. Voight
Reg. No. 42,205

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Washington, D.C. 20036
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Encl.: THE CLAIMS ON APPEAL (Appendix)

HBK/BAS

APPENDIX:

THE CLAIMS ON APPEAL:

21. (*previously submitted*) A hydrogenation catalyst comprising, as catalytically effective component, a composition consisting of
    (a) iron or a compound based on iron or a mixture thereof,
    (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,
    (c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and
    (d) from 0.001 to 1% by weight based on (a) of manganese.

22. (*previously submitted*) The catalyst defined in claim 21, wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

23. (*previously submitted*) The catalyst defined in claim 21, wherein the catalytically effective component is obtained by precipitating precursors of constituents (a), (b), (d) and optionally (c) in the presence or absence of support materials.

24. (*previously submitted*) The catalyst defined in claim 21, which is obtained by impregnating a support with a solution of constituents (a), (b), (d) and optionally (c).

25. (*previously submitted*) The catalyst defined in claim 21, which is obtained by spraying constituents (a), (b), (d) and optionally (c) onto a support.

26. (*previously submitted*) The catalyst defined in claim 21, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

27. (*previously submitted*) The catalyst defined in claim 21, wherein the promoter elements (b) are selected from aluminum, silicon and titanium.

28. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is based on magnesium and/or calcium.

29. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

30. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is present in an amount of from 0.01 to 0.1% by weight based on (a).

31. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

32. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (d) is present in an amount of from 0.01 to 0.2% by weight based on (a).

33. (*previously submitted*) A hydrogenation catalyst consisting essentially of a catalytically effective component and a support material, wherein the catalytically effective component is a composition consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

34. (*previously submitted*) The catalyst defined in claim 33, wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

35. (*previously submitted*) The catalyst defined in claim 33, which is obtained by precipitating precursors of constituents (a), (b), (d) and optionally (c) in the presence of the support materials.

36. (*previously submitted*) The catalyst defined in claim 33, which is obtained by impregnating the support with a solution of constituents (a), (b), (d) and optionally (c).

37. (*previously submitted*) The catalyst defined in claim 33, which is obtained by spraying constituents (a), (b), (d) and optionally (c) onto the support.

38. (*previously submitted*) The catalyst defined in claim 33, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

39. (*previously submitted*) The catalyst defined in claim 33, wherein constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

40. (*previously submitted*) The catalyst defined in claim 33, wherein constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

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February 10, 2004
Date of Deposit

Jason D. Voight
Person Making Deposit

Jason D Voight
Signature

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Honorable Commissioner
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ly occurring magnetite ore[8], optionally adding iron or iron oxide to the ore to achieve an iron oxide content of the catalyst of not less than 96.5%[9]. ***Dewdney et al.*** further state

> *It is preferable not to make any additions, other than iron oxide or iron, to the feed before or during fusion, as is done, for example, when promoters are added to iron oxides in the manufacture of ammonia synthesis catalysts.*[10]

The Examiner contends that the difference between the invention defined by appellants' claims and the catalyst disclosed by ***Dewdney et al.*** resides in the generic description of the catalyst and in the ratios[11]. However, it is well settled that the mere fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a prima facie case of obviousness[12].

The teaching of ***Dewdney et al.*** does not suggest or imply the utilization of a catalytically effective composition which *consists of* constituents (a) to (d) as defined in appellants' independent Claims 21 and 33, and wherein the following additional requirements are met:

- a promoter is present in an amount of from 0.001 to 0.3% by weight based on constituent (a), and
- the promoter is based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium, and
- manganese is present in an amount of from 0.001 to 1% by weight, based on constituent (a).

The Examiner contends that ***Dewdney et al.***'s Examples 1 and 2 provide for compositions which meet appellants' requirements[13]. ***Dewdney et al.*** refer in Example 1 to a Swedish magnetite ore and in Example 2 to a Labrador haematite ore. The Swedish magnetite ore contains a combination of Al_2O_3, SiO_2 and V_2O_5 in a total amount of about *0.9%* by

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8) For a review of the composition of iron ores in general see the material enumerated in ftn. (3), page 3, of appellants' Paper 11 and provided by appellants.

9) For example, col. 2, indicated lines 50 to 56, of ***US 3,986,985***.

10) For example, col. 2, indicated lines 56 to 61, of ***US 3,986,985***.

11) Paper No. 03, page 5, lines 6 to 12. Similarly, Paper No. 10, page 4, lines 10 to 13.

12) *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (CAFC 1994); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (CAFC 1992)

13) Paper No. 12, page 4, lines 5 and 6.

weight, based on the iron component, and the Labrador haematite contains a combination of Al_2O_3 and SiO_2 in a total amount of about 1.7% by weight, based on the iron component. The respective amounts are by far beyond the content of promoter elements which is allowed in accordance with appellants' invention as claimed. Further, neither one of the ores utilized in the representative examples of ***Dewdney et al.*** contain manganese. Appellants' catalytic composition is, therefore, clearly distinguished from the compositions used by ***Dewdney et al.*** in the representative examples.

To establish prima facie obviousness, all claim limitations must be taught or suggested by the prior art[14]. The mere fact that a prior art teaching may be modified in some manner so as to result in the invention as claimed does not render the requisite modification, and correspondingly the claimed invention, obvious where the prior art fails to suggest the desirability of such a modification[15]. The disclosure of ***Dewdney et al.*** does not teach or suggest all of the limitations which characterize the catalytically effective component defined in appellants' independent Claims 21 and 33, and the disclosure of ***Dewdney et al.*** also fails to suggest or imply the desirability of the modification which is necessary to arrive at the specific composition of appellants' catalytically effective component. Appellants' invention is therefore not deemed to be rendered obvious within the meaning of Section 103(a) by the teaching of ***Dewdney at al.***

II. The Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was rendered prima facie obvious under 35 U.S.C. §103(a) in light of the disclosure of ***Flick et al.***

The disclosure of ***Flick et al.*** relates to a catalyst for the partial hydrogenation of α,ω-dinitriles to α,ω-aminonitriles which catalyst is composed of[16]

(a) a nickel, cobalt, iron, ruthenium or rhodium compound,

(b) from 0.01 to 25% of a promoter based on a metal selected from the group of palladium, platinum, iridium, osmium, iron, copper, silver, gold, chromium, molybdenum, tungsten, manganese, rhenium,

14) *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

15) *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1783-84 (CAFC 1992); *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (CAFC 1984)

16) Col. 1, indicated line 62, to col. 2, indicated line 12, of ***US 5,527,946***.

zinc, cadmium, lead, aluminum, tin, phosphorus, arsenic, antimony, bismuth and rare earth metals, and

(c) from 0 to 5% of a compound based on an alkali metal or on an alkaline earth metal.

Flick et al. further point out in the Abstract of the disclosure that[17)]

> *the component* (a) is not based on iron *or iron and one of the metals selected from the group consisting of cobalt, ruthenium and rhodium* when (b) is *a promoter* based on *a metal selected from the group consisting of* titanium, manganese, chromium *and molybdenum,*

Additionally, ***Flick et al.*** mention that the catalyst may be supported or unsupported and that suitable support materials are porous oxides such as alumina, silica, alumosilicates, lanthanum oxide, titanium dioxide, zirconium dioxide, magnesium dioxide, zinc oxide an zeolites as well as active carbon and mixtures of those materials[18)].

The Examiner erroneously contends that ***Flick et al.*** teach the use of iron based compounds and silicon and titanium promoters pointing to the Abstract and catalyst B disclosed in col. 2, indicated lines 33 to 38, of ***US 5,527,946***[19)]. On the one hand, the Abstract of ***Flick et al.***'s disclosure clearly *excludes* iron based catalysts which contain as a promoter titanium. On the other hand, the promoter metals enumerated as component (b) of ***Flick et al.***'s catalyst do not include silicon. Last but not least, the catalyst B of ***Flick et al.*** is not based on iron but is based on cobalt and contains iron oxide (Fe_2O_3) as a promoter element in an amount of 0.5% by weight.

The disclosure of ***Flick et al.*** neither suggests nor implies a catalytically effective composition consisting of appellants' constituents (a) to (d) wherein constituent (a) is iron or a compound based on iron and (a) is combined

- with a promoter (b) composed of 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium, which is present in an amount of from 0.001 to 0.3% by weight based on the iron component (a); and
- with manganese (d) in an amount of from 0.001 to 1% by weight based on the iron component (a).

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17) Abstract of ***US 5,527,946***, lines 17 to 21, *emphasis added.*

18) Col. 2, indicated lines 46 to 51, of ***US 5,527,946***.

19) Paper No. 03, page 5, lines 13 to 15.

The Examiner further takes the position that the teaching of ***Flick et al.*** places the constituents and the amounts of appellants' catalytically effective composition within the purview of a person of ordinary skill in the art[20]. However, even if appellants' claims are used as a roadmap it is not possible to pick and choose the information from the disclosure of ***Flick et al.*** which is necessary to recreate the combination which characterizes appellants' catalytically effective composition.

On the one hand, of the promoter metals which are enumerated by ***Flick et al.*** as constituent (b) encompass aluminum as the only promoter metal corresponding to appellants' component (b). It is therefore not possible to recreate appellants' requirement for a promoter (b) composed of 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium. On the other hand, ***Flick et al.*** exclude manganese as a promoter constituent when the catalyst is based on iron. It is therefore not possible to recreate appellants' requirement for the presence of manganese in the iron based catalytically effective component of appellants' catalyst.

The disclosure of ***Flick et al.*** neither teaches nor suggests all of the limitations which characterize appellants' invention, and the disclosure of ***Flick et al.*** also fails to suggest or imply the desirability of the modification which is necessary to arrive at the specific composition of appellants' catalytically effective component. Appellants' invention is therefore not deemed to be rendered obvious within the meaning of Section 103(a) by the teaching of ***Flick at al.***

III. The Examiner erred finding that the subject matter of appellants' Claims 21 to 40 was prima facie obvious under 35 U.S.C. §103(a) in light of the disclosure of ***Dewdney et al.*** when taken in combination with the disclosure of ***Flick et al.***

The Examiner takes the position that a person of ordinary skill in the art would have been motivated to prepare a catalyst wherein the catalytically effective component consists of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on

20) Paper No. 12, page 5, lines 4 to 6.

2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese,

as required in accordance with appellants' invention by combining the teachings of ***Dewdney et al.*** and ***Flick et al.***[21]).

The Examiner's position is not deemed to be well taken because neither the teaching of ***Dewdney et al.*** nor the disclosure of ***Flick et al.*** suggest or imply the desirability of manganese in an iron-based catalyst. The disclosure of ***Dewdney et al.*** is completely silent concerning manganese as a constituent of the iron oxide catalyst and ***Flick et al.*** exclude manganese as a promoter metal (b) when the catalyst is based on iron[22]). As such, a combination of ***Dewdney et al.***'s teaching and ***Flick et al.***'s disclosure cannot suggest or imply the desirability of the specific modification which is required to arrive at appellants' invention. However, in a determination under Section 103(a) the teaching or suggestion to make the claimed combination has to be found in the prior art and cannot be based on the applicant's disclosure[23]). A combination of the teachings of ***Dewdney et al.*** and ***Flick et al.*** is therefore also not deemed to establish that appellants' invention was obvious within the meaning of 35 U.S.C. §103(a).

CONCLUSION

In light of the foregoing explanations and remarks, appellants respectfully urge that the Examiner erred finding that appellants' invention which requires a catalytically effective constituent consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

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21) Paper No. 03, page 5, line 16, to page 6, line 6.

22) The section of ***Flick et al.***'s abstract cited at the outset of page 6 of this brief.

23) *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (CAFC 1984); see also, eg., *Interconnect. Planning Corp. v. Feil*, 774 F.2d 1132, 227 USPQ 543 (CAFC 1985)

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese,

was rendered *prima facie* obvious to a person having ordinary skill in the pertinent field by the teaching of ***Dewdney et al.*** and/or ***Flick et al.*** It is therefore respectfully requested that the Examiner's rejection of appellants' Claims 21 to 40 under 35 U.S.C. §103(a) as being unpatentable in light of the disclosure of ***Dewdney et al.*** and/or ***Flick et al.*** be reversed.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees, to Deposit Account No. 11.0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

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Encl.: THE CLAIMS ON APPEAL (Appendix)

HBK/BAS

APPENDIX:

THE CLAIMS ON APPEAL:

21. (*previously submitted*) A hydrogenation catalyst comprising, as catalytically effective component, a composition consisting of
    (a) iron or a compound based on iron or a mixture thereof,
    (b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,
    (c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and
    (d) from 0.001 to 1% by weight based on (a) of manganese.

22. (*previously submitted*) The catalyst defined in claim 21, wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

23. (*previously submitted*) The catalyst defined in claim 21, wherein the catalytically effective component is obtained by precipitating precursors of constituents (a), (b), (d) and optionally (c) in the presence or absence of support materials.

24. (*previously submitted*) The catalyst defined in claim 21, which is obtained by impregnating a support with a solution of constituents (a), (b), (d) and optionally (c).

25. (*previously submitted*) The catalyst defined in claim 21, which is obtained by spraying constituents (a), (b), (d) and optionally (c) onto a support.

26. (*previously submitted*) The catalyst defined in claim 21, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

27. (*previously submitted*) The catalyst defined in claim 21, wherein the promoter elements (b) are selected from aluminum, silicon and titanium.

28. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is based on magnesium and/or calcium.

29. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

30. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (c) is present in an amount of from 0.01 to 0.1% by weight based on (a).

31. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).

32. (*previously submitted*) The catalyst defined in claim 21, wherein constituent (d) is present in an amount of from 0.01 to 0.2% by weight based on (a).

33. (*previously submitted*) A hydrogenation catalyst consisting essentially of a catalytically effective component and a support material, wherein the catalytically effective component is a composition consisting of

(a) iron or a compound based on iron or a mixture thereof,

(b) from 0.001 to 0.3% by weight based on (a) of a promoter based on 2, 3, 4 or 5 elements selected from the group consisting of aluminum, silicon, zirconium, titanium and vanadium,

(c) from 0 to 0.3% by weight based on (a) of a compound based on an alkali and/or alkaline earth metal, and

(d) from 0.001 to 1% by weight based on (a) of manganese.

34. (*previously submitted*) The catalyst defined in claim 33, wherein the catalytically effective component is obtained by reduction with or without subsequent passivation of a magnetite.

35. (*previously submitted*) The catalyst defined in claim 33, which is obtained by precipitating precursors of constituents (a), (b), (d) and optionally (c) in the presence of the support materials.

36. (*previously submitted*) The catalyst defined in claim 33, which is obtained by impregnating the support with a solution of constituents (a), (b), (d) and optionally (c).

37. (*previously submitted*) The catalyst defined in claim 33, which is obtained by spraying constituents (a), (b), (d) and optionally (c) onto the support.

38. (*previously submitted*) The catalyst defined in claim 33, which has a BET surface area of from 3 to 20 m^2/g, a total pore volume of from 0.05 to 0.2 mL/g, an average pore diameter of from 0.03 to 0.1 μm and a 0.01 to 0.1 μm pore volume fraction within the range from 50 to 70%.

39. (*previously submitted*) The catalyst defined in claim 33, wherein constituent (c) is present in an amount of from 0.01 to 0.2% by weight based on (a).

40. (*previously submitted*) The catalyst defined in claim 33, wherein constituent (d) is present in an amount of from 0.001 to 0.3% by weight based on (a).